

**CLAIMS**

- 5 1. A process for manufacturing a protective article with a contiguous lamellar structure from a heterogeneous material comprising:
- (a) a polyolefin or a blend of polyolefins;
  - (b) at least one material forming a barrier to
  - 10 chemicals, this material having a melting point at least 5°C above the melting point of the polyolefin (a); and
  - (c) at least one compatibilizer for allowing the barrier material (b) to be dispersed in the polyolefin
  - 15 (a),
- said process comprising the following steps:
- (i) blending of constituents (a), (b) and (c);
  - (ii) extrusion of the blend obtained at (i) so as to form a film tube;
  - 20 (iii) stretching of the film tube obtained at (ii); and
  - (v) thermoforming of the film obtained at (iii),
- steps (iii) and (v) being controlled so that the thickness of the article at all points is between 60
- 25 and 190  $\mu\text{m}$ .
2. The process as claimed in claim 1, characterized in that component (a) is polyethylene.
- 30 3. The process as claimed in either of claims 1 and 2, characterized in that component (b) is chosen from: polyamides; polyesters, such as polyethylene terephthalate and polybutylene terephthalate; polycarbonates; ethylene/vinyl alcohol copolymers;
- 35 polyvinyl acetate and polyvinyl alcohol.

4. The process as claimed in claim 3, characterized in that component (b) is an ethylene/vinyl alcohol copolymer.

5 5. The process as claimed in any one of preceding claims 1 to 4, characterized in that the compatibilizer (c) is a polyolefin onto which carboxylic units have been grafted.

10 6. The process as claimed in claim 5, characterized in that the compatibilizer (c) is a polymer comprising polyolefin units onto which cyclic anhydride fragments are grafted, said polyolefin units being compatible with the polyolefin (a), the cyclic anhydride fragments  
15 being in an amount such that the percentage by weight of carbonyl functional groups relative to the total weight of the compatibilizer (c) is between 0.1 and 4%.

7. The process as claimed in any one of claims 1 to  
20 6, characterized in that constituents (a), (b) and (c) are introduced in amounts such that: the polyolefin (a) represents from 60 to 95%, preferably 70 to 90%, by weight of the weight of the blend; component (b) represents from 2 to 40%, preferably 3 to 20% and even  
25 more preferably 4 to 12%, by weight of the total weight of the blend; and component (c) is introduced in an amount such that the weight of the carbonyl functional groups of compound (c) represents 0.14 to 0.6% of the weight of component (b).

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8. The process as claimed in any one of preceding claims 1 to 7, characterized in that solid particles with a size ranging from 0.5 to 10 mm, preferably 1 to 7 mm and even more preferably 2 to 4 mm, are used for  
35 the blending (i) of components (a) and (b).

9. The process as claimed in any one of preceding claims 1 to 8, characterized in that, at step (ii), after having prepared a homogeneous blend of the three

components, this is conveyed to an extruder in which said blend is heated to a temperature above the melting point of component (b).

5 10. The process as claimed in any one of preceding claims 1 to 9, characterized in that, at step (ii), the blend is extruded through a die of the radial-channel helical type or of the flat type.

10 11. The process as claimed in any one of claims 1 to 10, characterized in that the stretching of the tube at step (iii) takes place by stretch blow molding.

12. The process as claimed in any one of claims 1 to  
15 11, characterized in that the cooled film tube is stretched with a blow ratio ranging from 1 to 5, preferably 1.5 to 3, and with a stretch ratio of 1 to 5, preferably 2 to 4.

20 13. The process as claimed in any one of claims 1 to 12, characterized in that it further includes, between steps (iii) and (v), a step (iv) of complexing with a nonwoven based on a polymer compatible with the polymer (a).

25 14. The process as claimed in any one of claims 1 to 13, characterized in that it further includes a welding step (vi).

30 15. A personal protective article, the walls of which are made of a material consisting of:

(a) a continuous polyolefin phase in which is dispersed;

(b) at least one material forming a barrier to  
35 chemicals, this material having a melting point at least 5°C higher than the melting point of the polyolefin (a); and

(c) at least one compatibilizer allowing the barrier material (b) to be dispersed in the polyolefin

(a), at least one portion of this article being thermoformed, this material having a thickness ranging from 60  $\mu\text{m}$  to 190  $\mu\text{m}$ .

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16. The article as claimed in claim 15, characterized in that it is in the form of a glove, overshoe, overalls, hood, shroud or cover.

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17. The article as claimed in claim 18, characterized in that the material from which it is made has a helium permeability improved by a factor of 4 or more over the polyolefin (a).